AMENDMENTS TO THE CLAIMS

Please amend Claim 1 as indicated below.

A complete listing of all claims is presented below.

1. (Currently Amended) A composition of matter, comprising:

a glassifier; and

a plurality of chemicals which are sufficient, in combination, to enable formation of an electro-optic material having an index of refraction that is responsive to an electric field, said glassifier combinesing with said chemicals so as to form transmissive material, one of the chemicals being chemically bonded to said glassifier such that said transmissive material is less responsive to said electric field than said electro-optic material.

2. (Original) The composition of Claim 1 wherein said chemicals comprise lead, lanthanum, zirconium, and titanium which, in combination, are sufficient to enable formation of an electrically activated PLZT material.

3. (Original) The composition of Claim 2 wherein said lead is chemically bonded to said glassifier to form a lead glass.

4. (Original) The composition of Claim 1 wherein said glassifier comprises silica (SiO_2).

5. (Original) The composition of Claim 4 wherein said silica comprises approximately 0.6% - 3.6% by weight of the transmissive material.

6. (Original) The composition of Claim 1 wherein said transmissive material has substantially the same refractive index as said electro-optic material in the absence of an electric field.

7. (Original) An optical apparatus comprising:

a first portion having electro-optic properties, said first portion comprised of electro-optic material having an index of refraction which varies in response to application of an electric field, said electro-optic material comprised of a plurality of chemicals which, in combination, are sufficient to impart said electro-optic properties;

a second portion comprised of said plurality of chemicals and a glassifier, said second portion having an index of refraction which is less responsive to an electric field than that of said first portion; and

a pair of electrodes positioned to apply said electric field to at least said first portion.

8. (Original) The optical apparatus of Claim 7 wherein said chemicals comprise oxides of lead, lanthanum, zirconium, and titanium which, in combination, are sufficient to enable formation of an electro-optically active PLZT material.

9. (Original) The optical apparatus of Claim 8 wherein said glassifier in said second portion comprises silica.

10. (Original) The optical apparatus of Claim 8 wherein said glassifier in said second portion comprises boric oxide.

11. (Original) The optical apparatus of Claim 9 wherein said silica comprises approximately 0.6% - 3.6% by weight relative to the combined weight of said silica and said chemicals in said second portion.

12. (Original) The optical apparatus of Claim 9 wherein said silica combine with said chemicals in said second portion to form a deactivated PLZT material.

13. (Original) The optical apparatus of Claim 7 wherein said first and second portions have substantially the same refractive index in the absence of an electric field.

14. (Original) The optical apparatus of Claim 13 wherein said refractive index of said first portion is lowered when an electric field is applied to said first portion.

15. (Original) The optical apparatus of Claim 14 wherein said first and second portions are joined together in a manner such that a boundary formed between the two portions is inclined at an approximately 45 degree angle with respect to an incident light beam.

16. (Original) The optical apparatus of Claim 15 wherein said incident light beam is totally internally reflected in response to application of an electric field, and wherein said incident light beam propagates through said boundary without substantial Fresnel reflection in the absence of an electric field.

17. (Original) A transmissive material, comprising:

a mixture comprised of (i) a plurality of materials comprising lead, lanthanum, zirconium, and titanium and (ii) a glass comprised of one of said lead, lanthanum, zirconium and titanium.

18. (Original) The transmissive material of Claim 17 wherein said glass comprises a lead glass.

19. (Original) The transmissive material of Claim 18 wherein said glass comprises a glassifier bonded to said lead.

20. (Original) The transmissive material of Claim 19 wherein said glassifier comprises silica.

21. (Original) The transmissive material of Claim 20 wherein said silica is approximately 0.6% - 3.6 % by weight of said mixture.

22. (Original) The transmissive material of Claim 17 wherein said glass suppresses electro-optical properties of said transmissive material.

23. (Original) The transmissive material of Claim 17 wherein the atomic ratio of lanthanum to zirconium to titanium is approximately 9/65/35.

24. (Original) A sol gel comprising:

a mixture of (i) TEOS, (ii) a compound comprised of lead, (iii) a compound comprised of lanthanum, (iv) a compound comprised of zirconium, and (v) a compound comprised of titanium.

25. (Original) The sol gel of Claim 24 wherein said TEOS comprises 1% - 2% of said mixture by weight.

26. (Original) The sol gel of Claim 24 wherein said compound comprised of lead is lead oxide (PbO), said compound comprised of lanthanum is lanthana (La_2O_3), said compound comprised of zirconium is zirconia (ZrO_2), said compound comprised of titanium is titania (TiO_2).

27. (Original) The sol gel of Claim 25 wherein said TEOS provides silica (SiO_2) to said mixture.

28. (Original) The sol gel of Claim 26 wherein the atomic ratio of lanthanum to zirconium to titanium in said sol gel is 1:55:45 respectively.

29. (Original) The sol gel of Claim 27 wherein said silica comprises 0.6% - 3.6% by weight relative to said silica, lanthana, titania, and zirconia.

30. (Original) A method of manufacturing a transmissive material, comprising:

providing a sol gel that includes constituent components which, in combination, are sufficient to enable formation of an electro-optic material having one index of refraction in the absence of an electric field and another significantly different index upon exposure to an electric field, but which returns to said one index upon removal of said electric field;

processing the sol gel to form a transmissive material having an index of refraction that is substantially insensitive to application of said electric field, said processing comprising heating said sol gel to chemically react at least some of said components.

31. (Original) The method of Claim 30 wherein providing said sol gel comprises providing a colloidal suspension comprising silica, lead oxide, lanthana, titania, and zirconia.

32. (Original) The method of Claim 31 wherein providing said colloidal suspension comprises preparing a PLZT precursor solution and mixing said PLZT precursor solution with a TEOS solution, said TEOS solution provides silica to said PLZT precursor solution.

33. (Original) The method of Claim 30 wherein heating said sol gel comprises sintering said sol gel at approximately 700 C.

34. (Original) The method of Claim 33 wherein heating said sol gel comprises heating said sol gel to chemically react said silica with said lead oxide.

35. (Original) The method of Claim 33 wherein preparing said PLZT precursor solution comprises mixing together titanium acetyl acetonate, zirconium acetate, lead subacetate, and lanthanum nitrate.

36. (Original) The method of Claim 32 wherein mixing said PLZT precursor solution with said TEOS solution comprises mixing approximately 1% - 2% by weight of said TEOS solution in said PLZT solution.

37. (Original) A transmissive material produced in accordance with the method of Claim 30.

38. (Original) A method of manufacturing a transmissive material, comprising:

providing a plurality of chemicals which, in combination, are sufficient to enable formation of a polycrystalline electro-optic material having electro-optic properties which

cause a refractive index of the material to change in response to application of an electric field;

forming a structure using said chemicals comprising introducing a substance which interferes with the orderly formation of said polycrystalline structure to suppress the electro-optic properties of the structure.

39. (Original) The method of Claim 38 wherein providing said plurality of chemicals comprises preparing a mixture of TEOS, titanium acetyl acetonate, zirconium acetate, lead subacetate, and lanthanum nitrate.

40. (Original) The method of Claim 39 wherein providing said plurality of chemicals further comprises adding potassium acetate to said mixture.

41. (Original) The method of Claim 38 wherein introducing said material comprises introducing a glassifier.

42. (Original) The method of Claim 41 wherein introducing said glassifier comprises introducing silica.

43. (Original) The method of Claim 42 wherein introducing said glassifier comprises bonding said glassifier to at least one of said plurality of chemicals to form a glass, which interferes with the orderly formation of said polycrystalline structure.

44. (Original) A transmissive material formed in accordance with the method of Claim 38.

45. (Original) An optical switch comprising an electro-optic portion having electro-optic properties juxtaposed adjacent a non-electro-optic portion forming a boundary therebetween, said optical switch formed by the method comprising:

introducing a plurality of chemicals which in combination are sufficient to impart electro-optical properties in a first region of said switch to form said electro-optic portion;

introducing a plurality of chemicals into a second region adjacent said first region, said chemicals being sufficient to enable formation of an electro-optic material;

combining a glassifier with said plurality of chemicals; and

heating said chemicals and said glassifier to form a transmissive material in said second region having index of refraction substantially insensitive to an applied electric field.